

# Linyin Cheng, PhD

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## Contact Information

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## Education

- ✧ Ph.D. **University of California, Irvine**  
Civil and Environmental Engineering (Hydroclimate), 2014
- ✧ M.S. **Clarkson University**  
Civil and Environmental Engineering (Hydrodynamic), 2011
- ✧ B.S. **Sichuan University**  
Civil Engineering (Hydraulic and Hydroelectric), 2009
- ✧ B.S. **Sichuan University**, Law, 2009

## Research Interests

- ✧ Hydrologic and Climatic Extremes
- ✧ Extreme Value Theory, Conditional Extreme Value Analysis
- ✧ Stationary and Non-stationary Processes, Risk Analysis
- ✧ Multivariate Analysis, Copula
- ✧ Bayesian Hierarchical Modeling, Empirical Bayes
- ✧ Spatial and Temporal Stochastic Modeling, Max-stable process
- ✧ Detection and Attribution

## Research Experience

- ✧ Associate Research Scientist **NOAA, ESRL/PSD** (10/2014 to present)
  - research focus: climate change impact assessment on water resources
  - research focus: ENSO effects on climatic extremes
- ✧ Postdoctoral Scholar **University of Colorado, Boulder, and NOAA/CIRES** (10/2014 – 10/2015)
  - research focus: develop frameworks for spatio-temporal extreme value analysis
- ✧ Advanced Study Program Graduate visitor **NCAR** (6/2013 – 9/2013)
  - research focus: empirical Bayes estimation for the conditional extreme value model
  - research focus: develop the non-stationary extreme value analysis model (NEVA)
- ✧ Research Assistant **University of California, Irvine** (9/2011 – 8/2014)
  - research focus: extreme value analysis in hydrology and climatology
  - Ph.D. dissertation: Frameworks for Univariate and Multivariate Non-stationary Analysis of Climatic Extremes
- ✧ Research Assistant **Clarkson University** (8/2009 – 4/2011)
  - research focus: numerical modeling of river ice dynamics
  - M.S. thesis: A Numerical Study on the upper St. Lawrence River Ice Dynamics and the Need for the Ice Sluice Gates

## Teaching Experience & Interests

- ✧ Teaching Assistant
  - Lectures in lab and discussion sessions, grade problem sets, papers and exams for

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Watershed Modeling course at UC-Irvine for academic years of 2013 and 2014

- Lectures in lab and discussion sessions for Geographic Information System course at UC-Irvine for academic year of 2014
- ✧ Co-instructors
  - Guest lectures on extreme value analysis in Climate Data Analysis course at UC-Irvine for academic year of 2014
- ✧ Organizing Committee
  - Copulas for Hydrology and Climate Applications Workshop, UC-Irvine, 2014
- ✧ Peer Mentors
  - Mentor fellow graduate students at UC-Irvine for academic years of 2012 and 2013

### Fellowship and Awards

- ✧ Received the **AGU's Natural Hazards Award for Graduate Research 2015**. Award will be offered in the AGU Fall Meeting, 2015
- ✧ Received the **Cooperative Institute for Research in Environmental Sciences (CIRES) Fellowship** in Postdoctoral Program from 10/2014-10/2015
- ✧ Selected to receive the **Advanced Study Program (ASP) Fellowship** in Postdoctoral Program at the National Center for Atmospheric Research (NCAR) in 2014
- ✧ Received the **AGU's Outstanding Student Paper Awards (OSPAs) in Hydrology session**, for the AGU Fall meeting, 2013 poster "Non-stationary Extreme Value Analysis in a Changing Climate: A Software Package"
- ✧ Received the **Advanced Study Program** support to participate in the Graduate Visitor Program at the National Center for Atmospheric Research (NCAR) from 6/2013 – 9/2013
- ✧ Received **Teaching Assistantship** and **Graduate Research Scholarship** for Ph.D. research at UC-Irvine 2011-2014.

### Publications

1. **Cheng L.**, AghaKouchak A., Gilleland E., Katz R., 2014, Non-stationary Extreme Value Analysis in a Changing Climate: A Software Package, *Climatic Change*, 127(2), 353-369, doi: 10.1007/s10584-014-1254-5.  
NEVA package is available online:  
<http://www.mathworks.com/matlabcentral/fileexchange/48238-nonstationary-extreme-value-analysis--neva--toolbox>
2. **Cheng L.**, AghaKouchak A., 2014, Precipitation Intensity-Duration-Frequency Curves for Infrastructure Design in a Changing Climate, *Scientific Reports*, 4, 7093, doi: 10.1038/srep07093.
3. **Cheng L.**, AghaKouchak A., 2015, A Methodology for Deriving Climate Response from Multimodel Ensemble Climate Simulations, *Journal of Hydrology*, 522, 49-57, doi: 10.1016/j.jhydrol.2014.12.025.
4. **Cheng L.**, Gilleland E., Heaton M., AghaKouchak A., 2014, Empirical Bayes estimation for

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the conditional extreme value model, *Stat*, 3, 391-406, doi: 10.1002/sta4.71.

5. **Cheng L.**, AghaKouchak A., Phillips T., 2015, Non-stationary Return Levels of Monthly Temperature Extremes based on CMIP5 Multi-Model Simulations, *Climate Dynamics*, doi: 10.1007/s00382-015-2625-y.
6. AghaKouchak A., **Cheng L.**, Mazdiyasni O., Farahmand A., 2014, Global Warming and Changes in Risk of Concurrent Climate Extremes: Insights from the 2014 California Drought *Geophysical Research Letters*, 41, 8847-8852, doi: 10.1002/2014GL062308.
7. Nasrollahi N., AghaKouchak A., **Cheng L.**, Damberg L., Phillips T., Miao C., Hsu K., and Sorooshian S., 2015, How Well Do CMIP5 Climate Simulations Replicate Historical Trends and Patterns of Meteorological Droughts? *Water Resources Research*, 51(4), 2847-2864, doi: 10.1002/2014WR016318.
8. **Cheng L.**, Hoerling M., AghaKouchak A., Livneh B., Quan X., 2015, Current Effects of Human-induced Climate Change on California Drought (*Journal of Climate* under revision)
9. Hoerling M., Eischeid J., Perlwitz J., Quan X., Wolter K., **Cheng L.**, 2015, Characterizing Recent Trends in U.S. Heavy Precipitation (*Journal of Climate* under revision)
10. Hoell A., Hoerling M., Eischeid J., Wolter K., Dole R., Perlwitz J., Xu T., **Cheng L.**, 2015, Does El Nino Intensity Matter for California Precipitation (*Geophysical Research Letters* under revision)
11. **Cheng L.**, Rajagopalan B., AghaKouchak A., Bracken C., 2015, A Generalized Spatio-temporal Framework for Climate Informed Extreme Precipitation Analysis (*in revision*)
12. **Cheng L.**, Rajagopalan B., 2015, Bayesian Spatial Modeling of Extreme Precipitation using Point Process Approach (*to be submitted*)
13. Bracken C., Rajagopalan B., **Cheng L.**, Kleiber W., Gangopadhyay S., 2015, Efficient Bayesian Hierarchical Spatial Modeling of Seasonal Precipitation Extremes (*to be submitted*)
14. Perlwitz J., Xu T., **Cheng L.**, Hoerling M., Wolter K., Barsugli J., 2015, Linking Extreme Weather Events and Extreme ENSO States (*to be submitted*)
15. Madadgar S., **Cheng L.**, Svoboda M., Wood A., AghaKouchak A., 2015, A New Hybrid Framework for Improving NMME Precipitation Forecasts (*in preparation*)
16. **Cheng L.** Hoerling M., Smith L., 2015, How unusual is the May 2015 Texas Flooding? (*in preparation*)

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### **Selected Conference Papers and Presentations**

- ✧ Cheng L., Hoerling M., AghaKouchak A., Livneh B., Quan X., Current Effect of Human-induced Climate Change in California Drought, AGU Chapman Conference, April 20-22, 2015, University of California, Irvine, Irvine, CA, USA
- ✧ Cheng L., Rajagopalan B., AghaKouchak A., Bracken C., A Generalized Spatio-temporal Framework for Climate Informed Extreme Precipitation Analysis, Hydrology Days, March 23-25, 2015, Colorado States University, Fort Collins, CO, USA
- ✧ Cheng L., Hoerling M., AghaKouchak A., Livneh B., Quan X., Multivariate Assessment on the Role of Climate Change in California Drought, The International ad hoc Detection and Attribution Meeting (IDAG), January 21-23, 2015, NCAR, Boulder, CO, USA
- ✧ Cheng L., AghaKouchak A., An Empirical Bayes Conditional Extreme Value Model for Detecting Changes in the Hydrological Cycle, AGU Fall Meeting, December 15-19, 2014, San Francisco, CA, USA
- ✧ Cheng L., AghaKouchak A., Gilleland E., Katz E., Non-stationary Extreme Value Analysis in a Changing Climate: A Software Package, AGU Fall Meeting, December 9-13, 2013, San Francisco, CA, USA (AGU OSPAs Awards)
- ✧ Cheng L., AghaKouchak A., Deriving Climate Response from CMIP5 Ensemble Climate Projections: Application to Analysis of Temperature and Precipitation Extremes, AGU Fall Meeting, December 3-7, 2012, , San Francisco, CA, USA
- ✧ AghaKouchak A., Cheng L., Tracking and Nowcasting of Hurricanes: a Data Fusion Approach, 3rd World Meteorological Organization (WMO) International Symposium on Nowcasting (WSN12), 6-10 August 2012, Rio de Janeiro, Brazil
- ✧ Cheng L., F. Huang, I.M. Knack, and H.T. Shen, 2011. "A Study on the Need of Ice Sluice Gates for St. Lawrence/FDR Power Project," Report to New York Power Authority